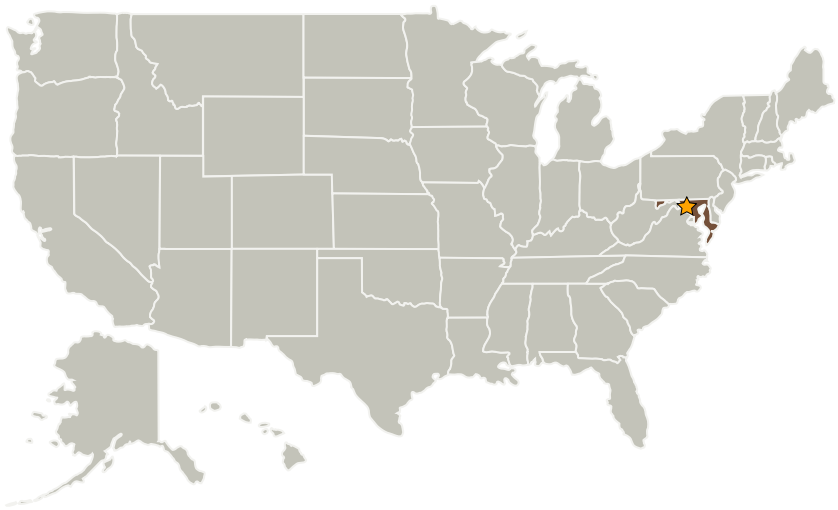
Beam Combination for Sparse Aperture Telescopes, Phase I

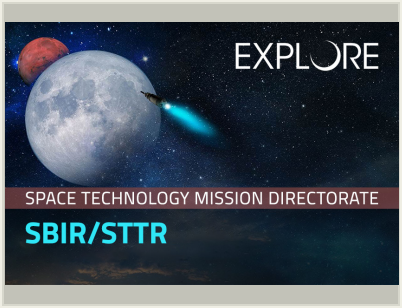
Completed Technology Project (2007 - 2007)

Project Introduction

The Stellar Imager, an ultraviolet, sparse-aperture telescope, was one of the fifteen Vision Missions chosen for a study completed last year. Stellar Imager will enable very high angular resolution images of stellar surfaces. The baselined design is a Fizeau beam combiner with 20 to 30 separated (free-flying) elements. This proposal is for funding to develop and test an alternative beam combiner design for the Stellar Imager Mission. We designate this new combiner the Spatial Frequency Remapper (SFR). In the SFR, the large field-of-view of the Fizeau design is sacrificed in favor of simultaneous observations at multiple wavelengths. Also, depending on the details of the design of the rest of the telescope, the SFR should either produce better images or relax the very tight stability requirements. Since the large field of view of the Fizeau combiner is not needed for the mission, the SFR, if it works, is clearly the better design; it's only expense is the addition of one or perhaps two extra reflections, needed to incorporate the spectral dispersion. The work that will be accomplished, including Phase 2, will include A) completing the analysis of the design as it pertains to Stellar Imager, B) performing a laboratory test at longer wavelengths to verify the soundness of that design and C) developing a more rigorous test of its imaging capabilities to be performed on a large, ground-based telescope. This final item will be the main component of the commercialization plan.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Seabrook Engineering	Supporting Organization	Industry	Seabrook, Maryland

Primary U.S. Work Locations
Maryland

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.1 Detectors and Focal Planes